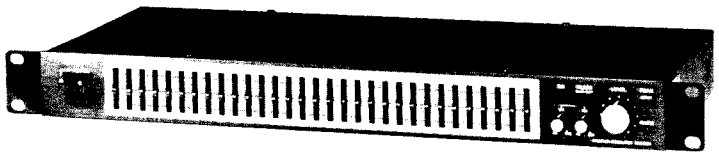
MU-E311

SERVICE MANUAL

AEP Model



SPECIFICATIONS

Frequency response	
	20 Hz $^{+0}_{-1.0}$ dB to 20 kHz $^{+0}_{-1.0}$ dB
Harmonic distortion	0.005% (EQ FLAT, FILTER OFF)
Noise level	Less than −100 dBs (IHF-A)
Maximum output level	
	+20 dBs
Input impedance	10 k ohms
Load impedance	More than 600 ohms
Equalizer	31 bands, 1/3 octave
Center frequency	20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1 k, 1.25 k, 1.6 k, 2 k, 2.5 k, 3.15 k, 4 k, 5 k, 6.3 k, 8 k, 10 k, 12.5 k, 16 k, 20 kHz
Adjustable range	±12 dB
Filter	HPF: 20 Hz to 300 Hz (adjustable) −18 dB/oct.
	LPF: 4 kHz to 20 kHz (adjustable) −18 dB/oct.
Dimensions	430 × 44 × 175 mm (w/h/d) (17 × 1 3/4 × 7 inches) not including the projecting parts and controls
Weight	3 kg (6 lb 10 oz)
Power requirements	220 AC, 50/60 Hz
Power consumption	11 W

OUTLINE

- Precise equalization will be possible by dividing the frequency range from 20 Hz to 20 kHz into 31 frequency bands in 1/3 octave units.
- The built-in variable filters cut the lower and higher frequencies by −18 dB/oct. To avoid pop noise or feedback problem, use the high-pass filter with appropriate cutoff frequency, which can be adjusted between 20 Hz and 300 Hz, so that optimum results can be obtained. The low-pass filter whose cutoff frequency can be adjusted between 4 kHz and 20 kHz sharply reduces the higher frequency.
- The floating electrically balanced type circuits are adopted to the input and output circuits instead of the transformer type, which results in the light and compact unit, and obtains the wide frequency range and low noise.
- The input and output levels can be adjusted according to the level of the connected equipment.
- The peak indicators are provided to show the excessive input or the clip of the output signal. The indicators will light when the signal reaches the maximum permissible level.
- The unit can be mounted in a 19-inch standard rack. The feet on the bottom of the unit can be removed so that the unit can be longitudinally mounted in the rack together with the other units. The rack mount brackets on both sides can also be removed to make it easy to mount the unit in the shelf or rack.

MICROFILM

GRAPHIC EQUALIZER

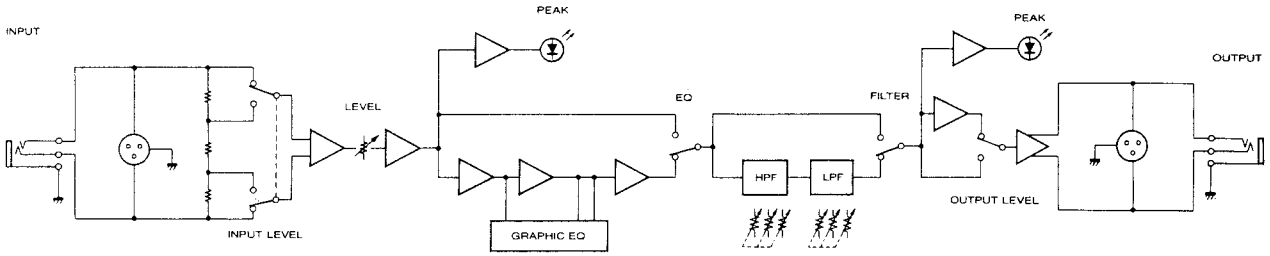
SONY®

AUD

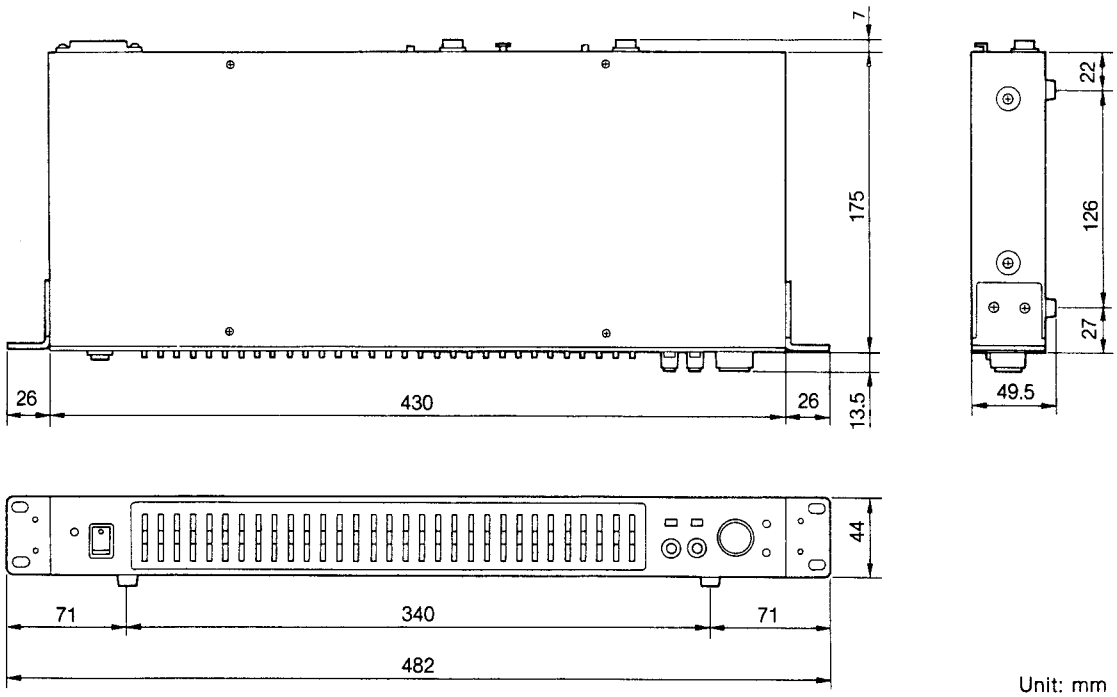
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

1. BLOCK DIAGRAM



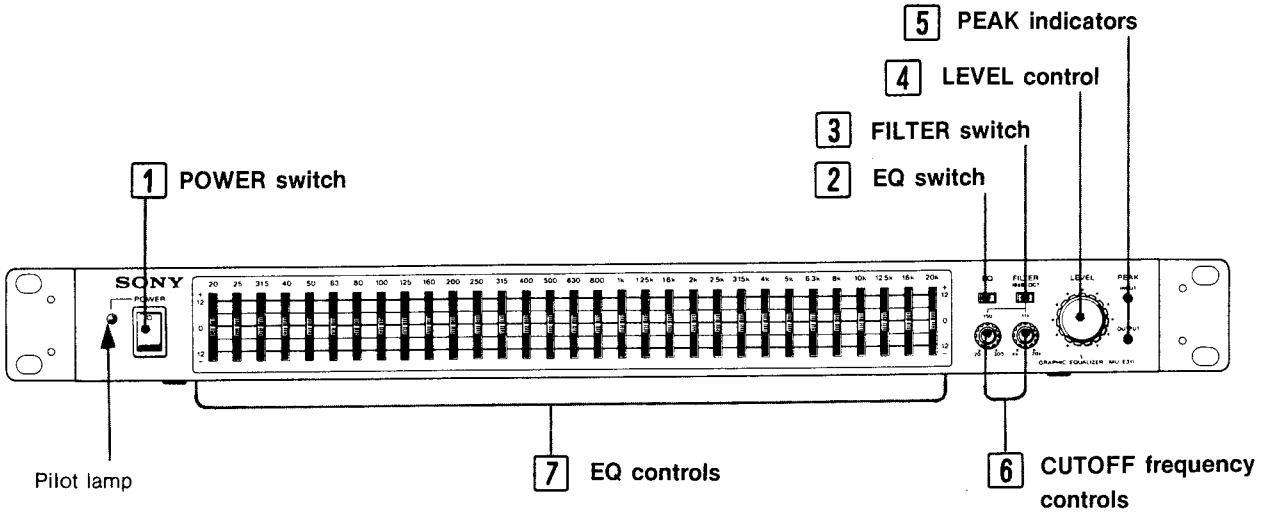
2. DIMENSIONS



Unit: mm

3. LOCATION AND FUNCTION OF PARTS

Front panel



1 POWER switch
Press the upper side of the switch to turn the power on. The pilot lamp lights while the power is on.

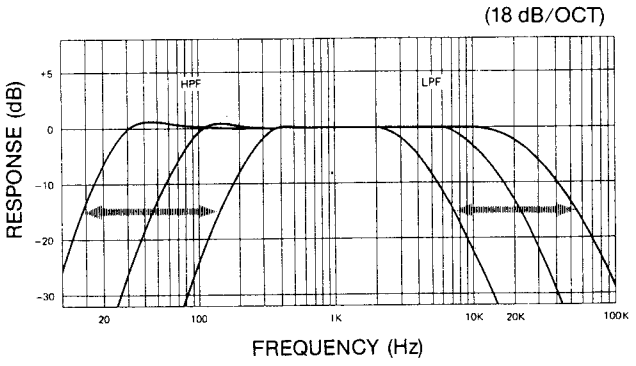
2 EQ (equalizer) switch
Depress this switch to activate the 7 EQ controls. While the equaliser is activated, the LEDs at the center of the EQ controls are lit.

3 FILTER switch
Depress this switch to activate the filters whose cutoff frequencies are adjusted by the 6 CUTOFF controls.

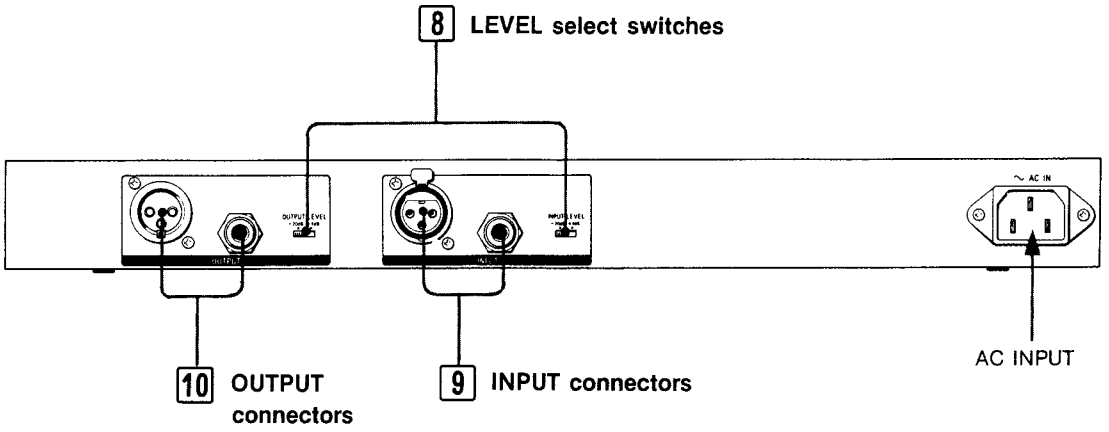
4 LEVEL control
Adjusts the input signal level.

5 PEAK indicators
Light up to indicate the excessive signal. When the upper INPUT indicator lights, turn the 4 LEVEL control to decrease the input signal level. When the lower OUTPUT indicator keeps lit, adjust the 7 EQ controls.

6 CUTOFF frequency controls
When the 3 FILTER switch is depressed, the cutoff frequency of the HPF (high pass filter) and LPF (low pass filter) can be adjusted with these controls. To sharply reduce the lower or higher frequency range, use these filters.

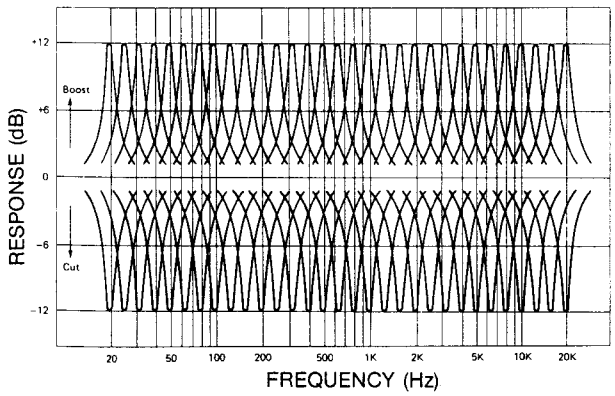


Rear panel



7 EQ (equalizer) controls

The frequency from 20 Hz to 20 kHz are divided into 31 bands in 1/3 octave units. These controls increase or decrease the signal level at each center frequency of these 31 bands.



The better quality sound can be obtained by the setting shown in figure A rather than that in figure B.

- Setting based on the 0 dB level

Fig. A

- Setting based on the level other than 0 dB

Fig. B

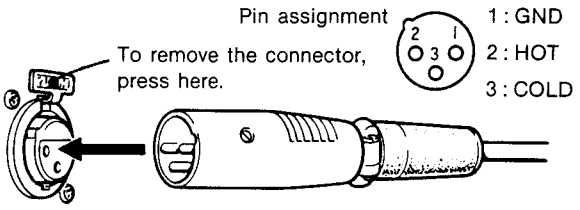
8 LEVEL select switches

Set to the appropriate position according to the level of the connected equipment.

9 INPUT connectors

Connect the input signals

Cannon XLR-3-31 type connector (balanced)

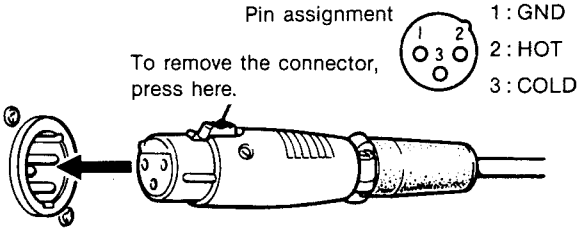


ø6.3 phone jack (unbalanced)

10 OUTPUT connectors

Supply the output signals

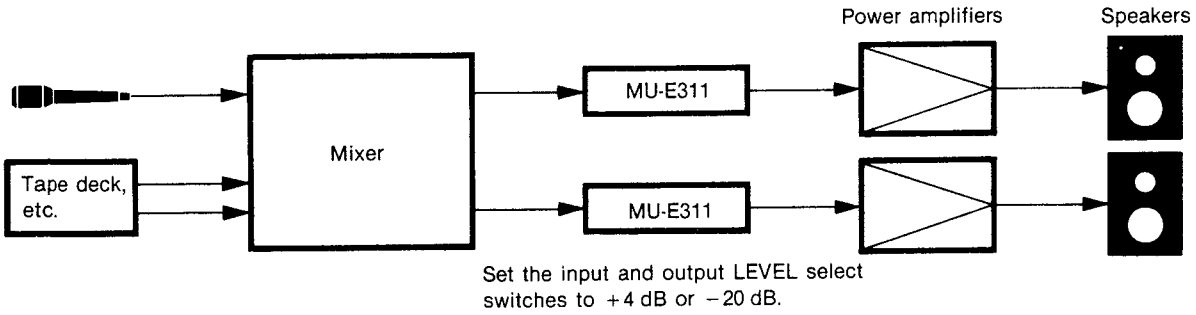
Cannon XLR-3-32 type connector (balanced)



ø6.3 phone jack (unbalanced)

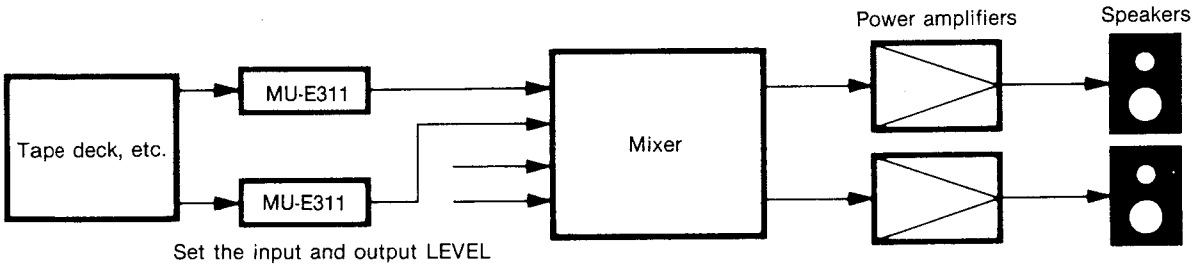
4. CONNECTION EXAMPLES

When the MU-E311 is connected between the mixer and the power amplifier
The output signal of the mixer is equalized.



Set the input and output LEVEL select switches to +4 dB or −20 dB.

When the MU-E311 is connected to the mixer
The program source is equalized.

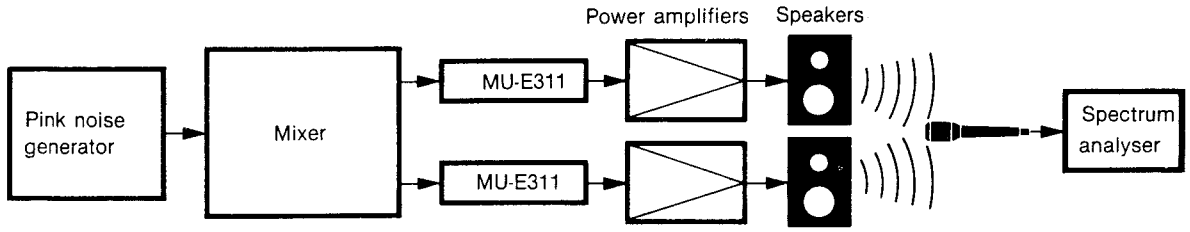


Set the input and output LEVEL select switches to −20 dB.

5. TO COMPENSATE THE ACOUSTICS

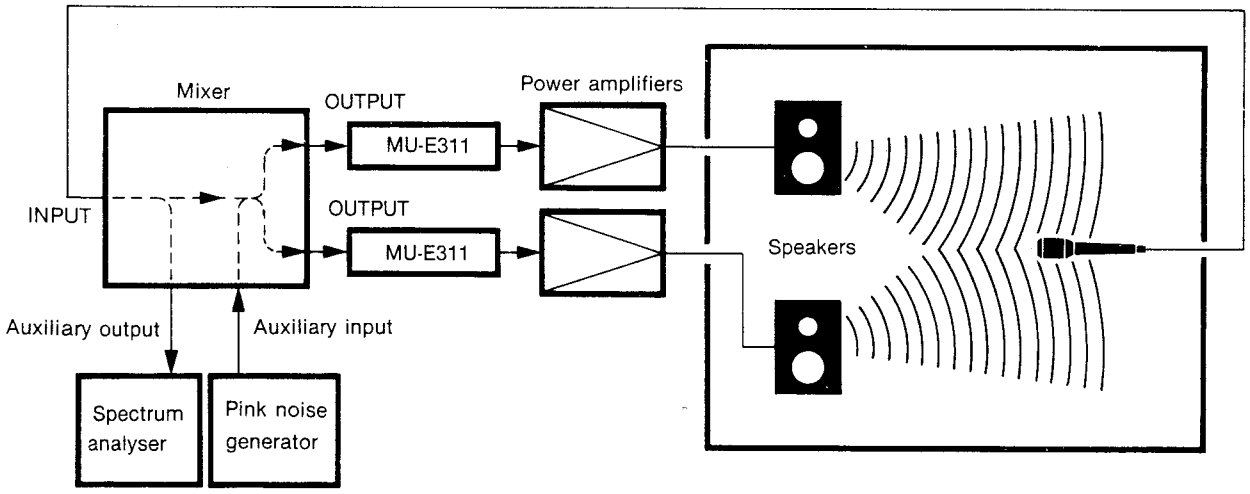
The MU-E311 divides the frequency range from 20 Hz to 20 kHz into 31 bands in 1/3 octave units so that precise equalization will be possible in order to compensate the acoustics.

To obtain a flat response of transmission characteristics
The sound may be heard unnaturally because of the acoustic characteristics of a hall or the listening position. The acoustics can be compensated with the following system.



Pick up the pink noise from the speakers, and measure it with the spectrum analyser at as many points as possible. Then adjust with the MU-E311 so that a flat response is obtained.

To obtain enough margin to avoid feedback problem
Feedback problem may occur at various frequencies because of the acoustic characteristics of a hall. The feedback problem may be avoided by decreasing the level of the frequency at which the feedback problem occurs. When the adjustment is made as follows, the feedback problem at the operating level will be avoided.
Generate the pink noise, and gradually increase the output level. Pick up the pink noise from the speakers, and find the frequency at which the feedback problem occurs by observing the spectrum analyzer. Then decrease the level of the frequency with the MU-E311. Repeat the steps of increasing the output level, finding a frequency at which the feedback problem occurs and decreasing the level of the frequency until no feedback problem occurs at any frequency when the output level is increased to the level of at least 6 dB higher than the operating level. Then decrease the output level to the operating level. Now the system has the enough margin to avoid the feedback problem.
It is recommended to adjust the balance acoustically by using the music source after adjusting the measuring equipment.



Spectrum Analyser
It divides the audible frequency range into several frequency ranges, and shows the frequency component of the input signal of each range by the sound pressure level.

Pink noise generator
It generates the noise which has the equalized level acoustically over the audible frequency range.

6. ELECTRICAL ADJUSTMENT

DC BALANCE ADJUSTMENT

no signal conditions
CONNECT VOM (50kΩ/V) Fig (1)
Adjust (VR104, 100kΩ) for the minimum VOM levels

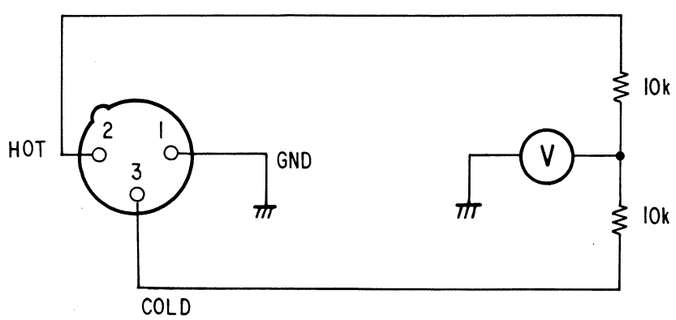
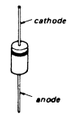


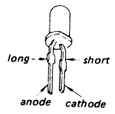
Fig (1)

Semiconductor Lead Layouts

1S1555
RD4.7EB2

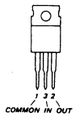


TLR-123
TLG-124A



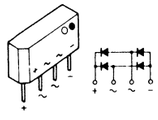
μPC7815H

μPC7915H

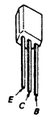


NJM2043S-D

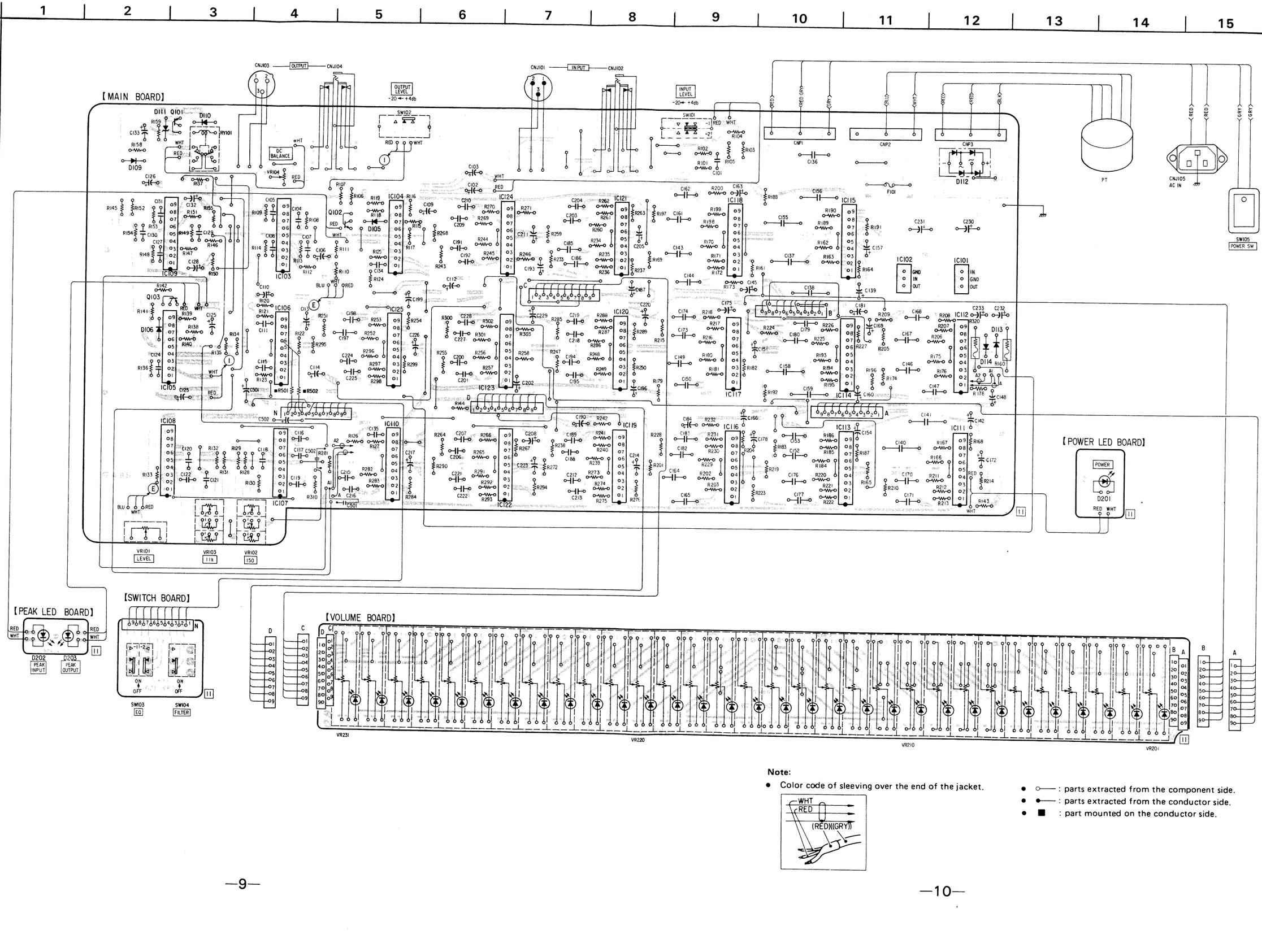
S1VB20



2SC2603
2SA1115



7. MOUNTING DIAGRAM

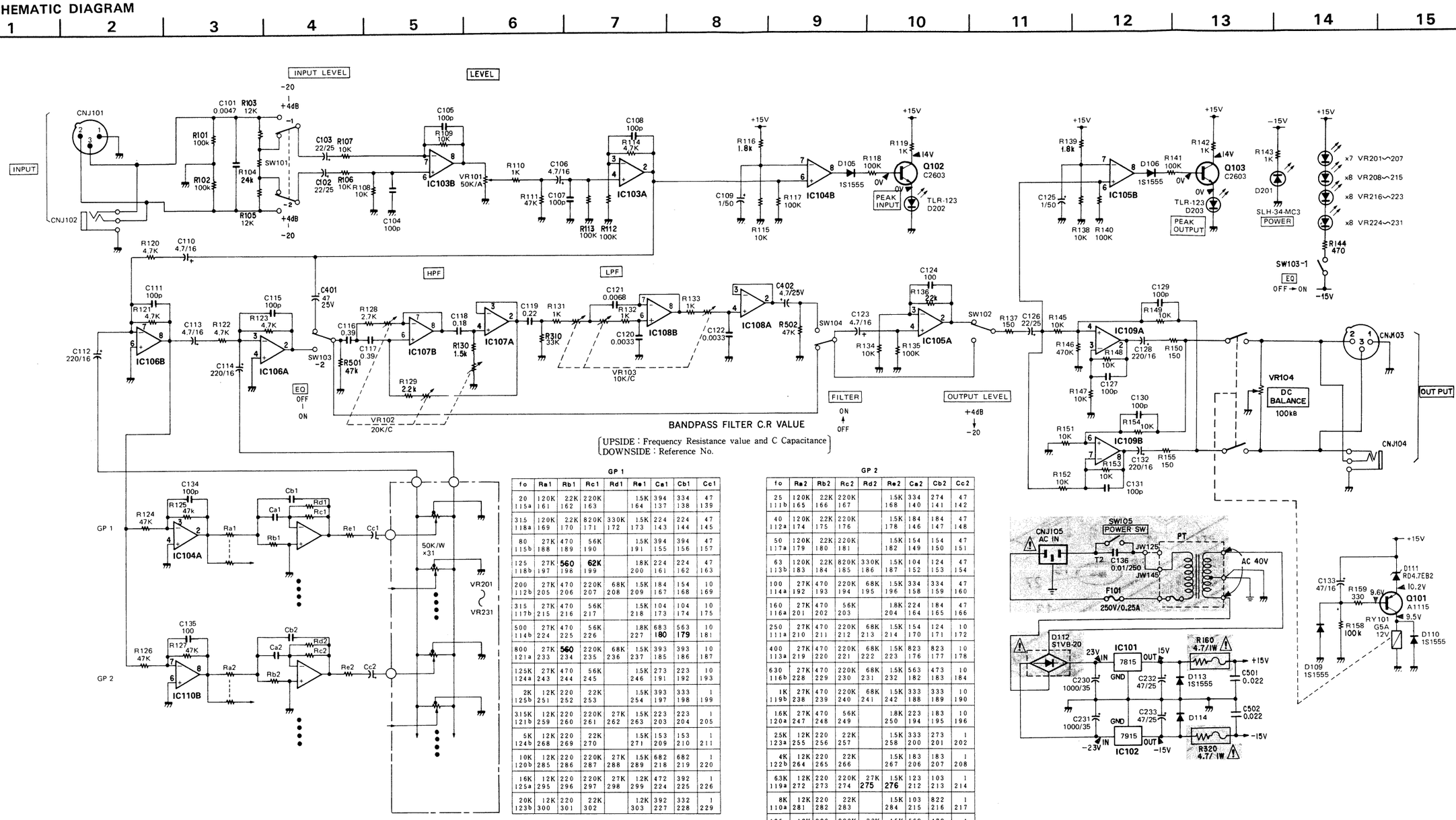


Note:

- Color code of sleeving over the end of the jacket.

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.

8. SCHEMATIC DIAGRAM



GP 1

fo	Ra1	Rb1	Rc1	Rd1	Re1	Ca1	Cb1	Cc1
20 115a	120K 161	22K 162	220K 163		1.5K 164	394 137	334 138	47 139
31.5 118a	120K 169	22K 170	820K 171	330K 172	1.5K 173	224 143	224 144	47 145
80 115b	27K 188	470 189	56K 190		1.5K 191	394 155	394 156	47 157
125 118b	27K 197	**560** 198	**62K** 199		1.8K 200	224 161	224 162	47 163
200 112b	27K 205	470 206	220K 207	68K 208	1.5K 209	184 167	154 168	10 169
315 117b	27K 215	470 216	56K 217		1.5K 218	104 173	104 174	10 175
500 114b	27K 224	470 225	56K 226		1.8K 227	683 **180**	563 **179**	10 181
800 121a	27K 233	**560** 234	220K 235	68K 236	1.5K 237	393 185	393 186	10 187
125K 124a	27K 243	470 244	56K 245		1.5K 246	273 191	223 192	10 193
2K 125b	12K 251	220 252	22K 253		1.5K 254	393 197	333 198	1 199
315K 121b	12K 259	220 260	220K 261	27K 262	1.5K 263	223 203	223 204	1 205
5K 124b	12K 268	220 269	22K 270		1.5K 271	153 209	153 210	1 211
10K 120b	12K 285	220 286	220K 287	27K 288	1.5K 289	682 218	682 219	1 220
16K 125a	12K 295	220 296	220K 297	27K 298	1.2K 299	472 224	392 225	1 226
20K 123b	12K 300	220 301	22K 302		1.2K 303	392 227	332 228	1 229

GP 2

fo	Re2	Rb2	Rc2	Rd2	Re2	Ca2	Cb2	Cc2
25 111b	120K 165	22K 166	220K 167		1.5K 168	334 140	274 141	47 142
40 112a	120K 174	22K 175	220K 176		1.5K 178	184 146	184 147	47 148
50 117a	120K 179	22K 180	220K 181		1.5K 182	154 149	154 150	47 151
63 113b	120K 183	22K 184	820K 185	330K 186	1.5K 187	104 152	124 153	47 154
100 114a	27K 192	470 193	220K 194	68K 195	1.5K 196	334 158	334 159	47 160
160 116a	27K 201	470 202	56K 203		1.8K 204	224 164	184 165	47 166
250 111a	27K 210	470 211	220K 212	68K 213	1.5K 214	154 170	124 171	10 172
400 113a	27K 219	470 220	220K 221	68K 222	1.5K 223	823 176	823 177	10 178
630 116b	27K 228	470 229	220K 230	68K 231	1.5K 232	563 182	473 183	10 184
1K 119b	27K 238	470 239	220K 240	68K 241	1.5K 242	333 188	333 189	10 190
16K 120a	27K 247	470 248	56K 249		1.8K 250	223 194	183 195	10 196
25K 123a	12K 255	220 256	22K 257		1.5K 258	333 200	273 201	1 202
4K 122b	12K 264	220 265	22K 266		1.5K 267	183 206	183 207	1 208
63K 119a	12K 272	220 273	220K 274	27K **275**	1.5K **276**	123 212	103 213	1 214
8K 110a	12K 281	220 282	22K 283		1.5K 284	103 215	822 216	1 217
125 122a	12K 290	220 291	220K 292	33K 293	1.5K 294	562 221	472 222	1 223

Note:

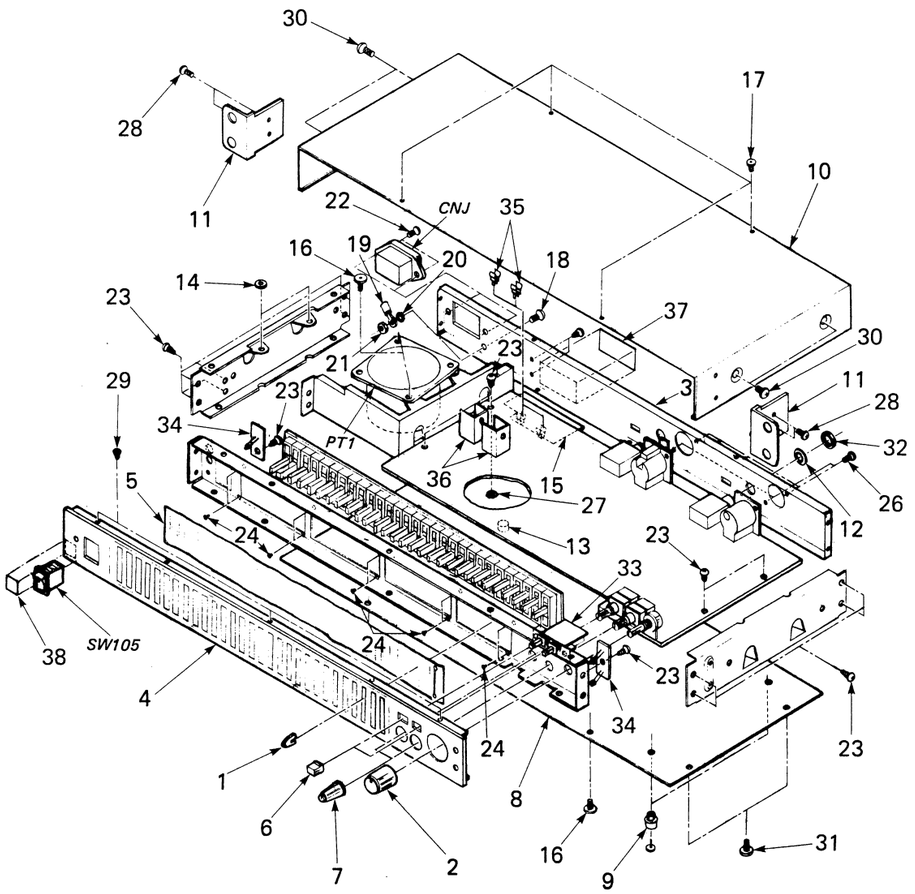
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

9. EXPLODED VIEW AND PARTS LIST

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color Indication of Appearance Parts
  Example: (RED) ..... KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts' Color

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



No.	Part No.	Discription
1	X-2335-061-1	KNOB ASSY,SLIDE
2	X-2335-062-4	KNOB ASSY,ROTARY(LEVEL)
3	*2-335-467-02	PLATE,REAR
4	2-335-475-01	PANEL ASSY,FRONT
5	*2-335-469-01	FELT
6	2-335-454-01	KNOB ,PUSH
7	2-335-451-41	KNOB ASSY,ROTARY(FILTER)
8	*2-335-471-01	PLATRE,BOTTOM
9	*3-670-155-11	FOOT
10	2-335-472-01	CASE
11	*2-335-473-01	BRAKET,RACK MOUNT
12	2-335-640-01	WASHER
13	*2-335-635-01	SPACER,A
14	*2-335-636-01	SPACER,B
15	*2-335-637-01	SHEET,PROTECTION
16	2-335-525-11	SCREW(L)HEAD 3X8
17	2-335-574-11	SCREW(S)HEAD 3X8
18	7-685-659-79	SCREW +BV 4X8 TP
19	7-623-510-01	LUG,TERMINAL
20	7-623-423-07	LW4 TYPE B

No.	Part No.	Discription
21	7-684-024-04	NUT, 4■■
22	7-685-646-79	SCREW +BV 3X8 TP
23	7-685-645-79	SCREW +BV 3X6 TP
24	7-627-553-37	SCREW +P 2X3
25	7-682-547-09	SCREW +B 3X6
26	7-682-549-09	SCREW +B 3X10
27	7-623-422-07	LW3 TYPE B
28	7-682-548-09	SCREW +B 3X8
29	7-685-245-19	SCREW +K 3X6 TP
30	7-682-560-09	SCREW +B 4X6
31	2-335-525-01	SCREW(L) HEAD 3X6
32	2-335-641-01	NUT,12■■
33	*1-621-483-11	PC BOARD,SEITCH
34	*1-621-484-11	PC,BOARD,M
35	*⚠1-535-146-00	CLIP FUSE
36	*4-875-327-01	HEAT SINK
37	*2-335-643-01	LABEL,MODEL NUMBER
38	*3-703-710-41	STICKER,SONY SYMBOL
CNJ105	⚠1-560-222-21	INLET,AC
PT	⚠1-448-992-11	TRANSFORMER,POWER
SW105	⚠1-554-011-00	SWITCH POWER

10. ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref No.	Part No.	Description		
C101	1-102-125-00	CERAMIC	0.0047μ	50V
C102	1-124-695-41	ELECT	22μ	25V
C103	1-124-695-41	ELECT	22μ	25V
C104	1-102-106-00	CERAMICS	100P	50V
C105	1-102-106-00	CERAMICS	100P	50V
C106	1-124-693-41	ELECT	4.7 μ	25V
C107	1-102-106-00	CERAMIC	100P	50V
C108	1-102-106-00	CERAMIC	100P	50V
C109	1-124-903-51	ELECT	1 μ	50V
C110	1-124-693-41	ELECT	4.7 μ	50V
C111	1-102-106-00	CERAMIC	100P	50V
C112	1-124-699-41	ELECT	220 μ	25V
C113	1-124-693-41	ELECT	4.7 μ	25V
C114	1-124-699-41	ELECT	220 μ	25V
C115	1-102-106-00	CERAMIC	100P	50V
C116	1-130-775-00	FILM	0.39μ	63V
C117	1-130-775-00	FILM	0.39μ	63V
C118	1-130-498-00	FILM	0.18μ	50V
C119	1-130-499-00	FILM	0.22μ	50V
C120	1-130-489-00	FILM	0.0033μ	50V
C121	1-106-192-00	FILM	0.0068μ	50V
C122	1-130-477-00	FILM	0.0033μ	50V
C123	1-124-693-41	ELECT	4.7 μ	25V
C124	1-102-106-00	CERAMIC	100P	50V
C125	1-124-903-51	ELECT	1 μ	50V
C126	1-124-695-41	ELECT	22μ	25V
C127	1-102-106-00	CERAMIC	100P	50V
C128	1-124-699-41	ELECT	220 μ	25V
C129	1-102-106-00	CERAMIC	100P	50V
C130	1-102-106-00	CERAMIC	100P	50V
C131	1-102-106-00	CERAMIC	100P	50V
C132	1-124-699-41	ELECT	220 μ	25V
C133	1-124-474-51	ELECT	47μ	16V
C134	1-102-106-00	CERAMIC	100P	50V
C135	1-102-106-00	CERAMIC	100P	50V
C136⚠	1-161-744-51	KILLER, SPARK	0.01μ	250V
C137	1-108-823-51	FILM	0.39μ	50V
C138	1-108-822-51	FILM	0.33μ	50V
C139	1-124-474-51	ELECT	47μ	16V
C140	1-108-822-51	FILM	0.33μ	50V
C141	1-108-821-51	FILM	0.27μ	50V
C142	1-124-474-51	ELECT	47μ	16V
C143	1-130-499-00	FILM	0.22μ	50V
C144	1-130-499-00	FILM	0.22μ	50V
C145	1-124-474-51	ELECT	47μ	16V
C146	1-130-498-00	FILM	0.18μ	50V
C147	1-130-498-00	FILM	0.18μ	50V
C148	1-124-474-51	ELECT	47μ	16V
C149	1-130-497-00	FILM	0.15μ	50V
C150	1-130-497-00	FILM	0.15μ	50V
C151	1-124-474-51	ELECT	47μ	16V
C152	1-130-495-00	FILM	0.1 μ	50V
C153	1-130-496-00	FILM	0.12μ	50V
C154	1-124-474-51	ELECT	47μ	16V
C155	1-108-823-51	FILM	0.39μ	50V
C156	1-108-823-51	FILM	0.39μ	50V
C157	1-124-474-51	ELECT	47μ	16V
C158	1-108-822-51	FILM	0.33μ	50V
C159	1-108-822-51	FILM	0.33μ	50V
C160	1-124-474-51	ELECT	47μ	16V
C161	1-130-499-00	FILM	0.22μ	50V
C162	1-130-499-00	FILM	0.22μ	50V
C163	1-124-474-51	ELECT	47μ	16V
C164	1-130-499-00	FILM	0.22μ	50V
C165	1-130-498-00	FILM	0.18μ	50V
C166	1-124-474-51	ELECT	47μ	16V
C167	1-108-609-51	FILM	0.18μ	50V
C168	1-130-497-00	FILM	0.15μ	50V
C169	1-123-316-51	ELECT	10μ	16V
C170	1-130-497-00	FILM	0.15μ	50V
C171	1-130-496-00	FILM	0.12μ	50V
C172	1-123-316-51	ELECT	10μ	16V
C173	1-130-495-00	FILM	0.1 μ	50V
C174	1-130-495-00	FILM	0.1 μ	50V
C175	1-123-316-51	ELECT	10μ	16V
C176	1-108-601-00	FILM	0.082 μ	50V
C177	1-108-601-00	FILM	0.082 μ	50V
C178	1-123-316-51	ELECT	10μ	16V
C179	1-108-597-00	FILM	0.056 μ	50V
C180	1-130-493-00	FILM	0.068 μ	50V
C181	1-123-316-51	ELECT	10μ	16V
C182	1-108-597-51	FILM	0.056 μ	50V
C183	1-108-595-00	FILM	0.047 μ	50V
C184	1-123-316-51	ELECT	10μ	16V
C185	1-108-593-00	FILM	0.039 μ	50V
C186	1-108-593-00	FILM	0.039 μ	50V
C187	1-123-316-51	ELECT	10μ	16V
C188	1-130-489-00	FILM	0.033 μ	50V
C189	1-130-489-00	FILM	0.033 μ	50V
C190	1-123-316-51	ELECT	10μ	16V
C191	1-130-488-00	FILM	0.027 μ	50V
C192	1-130-487-00	FILM	0.022 μ	50V
C193	1-123-316-51	ELECT	10μ	16V
C194	1-130-487-00	FILM	0.022 μ	50V
C195	1-130-486-00	FILM	0.018 μ	50V
C196	1-123-316-51	ELECT	10μ	16V
C197	1-108-593-00	FILM	0.039 μ	50V
C198	1-130-489-00	FILM	0.033 μ	50V
C199	1-124-903-51	ELECT	1 μ	50V
C200	1-130-489-00	FILM	0.033 μ	50V
C201	1-130-488-00	FILM	0.027 μ	50V
C202	1-124-903-51	ELECT	1 μ	50V
C203	1-130-487-00	FILM	0.022 μ	50V
C204	1-130-487-00	FILM	0.022 μ	50V
C205	1-124-903-51	ELECT	1 μ	50V
C206	1-130-486-00	FILM	0.018 μ	50V
C207	1-130-486-00	FILM	0.018 μ	50V
C208	1-124-903-51	ELECT	1 μ	50V
C209	1-108-583-00	FILM	0.015 μ	50V
C210	1-108-583-00	FILM	0.015 μ	50V

RefNo.	Part No.	Description
C211	1-124-903-51	ELECT 1 μ 50V
C212	1-130-484-00	FILM 0.012 μ 50V
C213	1-130-483-00	FILM 0.01 μ 50V
C214	1-124-903-51	ELECT 1 μ 50V
C215	1-130-483-00	FILM 0.01 μ 50V
C216	1-130-482-00	FILM 0.0082 μ 50V
C217	1-124-903-51	ELECT 1 μ 50V
C218	1-106-192-00	FILM 0.0068 μ 50V
C219	1-106-192-00	FILM 0.0068 μ 50V
C220	1-124-903-51	ELECT 1 μ 50V
C221	1-106-361-00	FILM 0.0056 μ 50V
C222	1-106-359-00	FILM 0.0047 μ 50V
C223	1-124-903-51	ELECT 1 μ 50V
C224	1-106-359-00	FILM 0.0047 μ 50V
C225	1-106-357-00	FILM 0.0039 μ 50V
C226	1-124-903-51	ELECT 1 μ 50V
C227	1-106-357-00	FILM 0.0039 μ 50V
C228	1-106-184-00	FILM 0.0033 μ 50V
C229	1-124-903-51	ELECT 1 μ 50V
C230	1-124-714-41	ELECT 1000 μ 35V
C231	1-124-714-41	ELECT 1000 μ 35V
C232	1-124-697-41	ELECT 47 μ 25V
C233	1-124-697-41	ELECT 47 μ 25V
C401	1-124-697-41	ELECT 47 μ 25V
C402	1-124-693-41	ELECT 4.7 μ 25V
C501	1-161-240-51	CERAMIC 0.022 μ 50V
C502	1-161-240-51	CERAMIC 0.022 μ 50V
CNJ101	1-563-080-11	CONNECTOR (INPUT)
CNJ102	1-507-552-00	JACK (INPUT)
CNJ103	1-566-852-11	CONNECTOR (OUTPUT)
CNJ104	1-507-552-00	JACK (OUTPUT)
CNJ105⚠	1-560-222-21	INLET 3P (AC IN)
CNP101	1-535-140-00	BASE POST 3P
CNP102	1-535-140-00	BASE POST 3P
CNP103	1-535-140-00	BASE POST 3P
D105	8-719-815-55	DIODE 1S1555
D106	8-719-815-55	DIODE 1S1555
D109	8-719-815-55	DIODE 1S1555
D110	8-719-815-55	DIODE 1S1555
D111	8-719-100-27	DIODE RD4.7EB2
D112⚠	8-719-511-40	DIODE SIVB40
D113	8-719-815-55	DIODE 1S1555
D114	8-719-815-55	DIODE 1S1555
D201	8-719-812-43	LED TLG124A
D202	8-719-812-31	LED TLR-123
D203	8-719-812-31	LED TLR-123
F101⚠	1-532-614-11	FUSE GLASS 0.25A
IC101	8-759-171-15	IC μPC7815H
IC102	8-759-179-15	IC μPC7915H
IC103	8-759-700-05	IC NJM2043S-D
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IC125	8-759-700-05	IC NJM2043S-D

RefNo.	Part No.	Description
PT⚠	1-448-992-11	TRANSFORMER, POWER
Q101	8-729-611-52	TRANSISTOR 2SA1115E
Q102	8-729-801-72	TRANSISTOR 2SC2603E
Q103	8-729-801-72	TRANSISTOR 2SC2603E
R101	1-249-441-11	CARBON 100K 1/6W
R102	1-249-441-11	CARBON 100K 1/6W
R103	1-249-430-11	CARBON 12K 1/6W
R104	1-215-454-11	CARBON 24K 1/6W
R105	1-249-430-11	CARBON 12K 1/6W
R106	1-249-429-11	CARBON 10K 1/6W
R107	1-249-429-11	CARBON 10K 1/6W
R108	1-249-429-11	CARBON 10K 1/6W
R109	1-249-429-11	CARBON 10K 1/6W
R110	1-249-417-11	CARBON 1K 1/6W
R111	1-249-437-11	CARBON 47K 1/6W
R112	1-249-441-11	CARBON 100K 1/6W
R113	1-249-441-11	CARBON 100K 1/6W
R114	1-249-425-11	CARBON 4.7K 1/6W
R115	1-249-429-11	CARBON 10K 1/6W
R116	1-249-420-11	CARBON 1.8K 1/6W
R117	1-249-441-11	CARBON 100K 1/6W
R118	1-249-441-11	CARBON 100K 1/6W
R119	1-249-417-11	CARBON 1K 1/6W
R120	1-249-425-11	CARBON 4.7K 1/6W
R121	1-249-425-11	CARBON 4.7K 1/6W
R122	1-249-425-11	CARBON 4.7K 1/6W
R123	1-249-425-11	CARBON 4.7K 1/6W
R124	1-249-437-11	CARBON 47K 1/6W
R125	1-249-437-11	CARBON 47K 1/6W
R126	1-249-437-11	CARBON 47K 1/6W
R127	1-249-437-11	CARBON 47K 1/6W
R128	1-249-434-11	CARBON 27K 1/6W
R129	1-249-421-11	CARBON 2.2K 1/6W
R130	1-249-419-11	CARBON 1.5K 1/6W
R131	1-249-417-11	CARBON 1K 1/6W
R132	1-249-417-11	CARBON 1K 1/6W
R133	1-249-417-11	CARBON 1K 1/6W
R134	1-249-429-11	CARBON 10K 1/6W
R135	1-249-441-11	CARBON 100K 1/6W
R136	1-249-435-11	CARBON 22K 1/6W
R137	1-249-407-11	CARBON 150 1/6W
R138	1-249-429-11	CARBON 10K 1/6W
R139	1-249-420-11	CARBON 1.8K 1/6W
R140	1-249-441-11	CARBON 100K 1/6W
R141	1-249-441-11	CARBON 100K 1/6W
R142	1-249-417-11	CARBON 1K 1/6W
R143	1-249-417-11	CARBON 1K 1/6W
R144	1-249-413-11	CARBON 470K 1/6W
R145	1-249-429-11	CARBON 10K 1/6W
R146	1-247-895-00	CARBON 470K 1/6W
R147	1-249-429-11	CARBON 10K 1/6W
R148	1-249-429-11	CARBON 10K 1/6W
R149	1-249-429-11	CARBON 10K 1/6W
R150	1-249-407-11	CARBON 150 1/6W

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RefNo.	Part No.	Description		
R151	1-249-429-11	CARBON	10K	1/6W
R152	1-249-429-11	CARBON	10K	1/6W
R153	1-249-429-11	CARBON	10K	1/6W
R154	1-249-429-11	CARBON	10K	1/6W
R155	1-249-407-11	CARBON	150	1/6W
R156	1-249-441-11	CARBON	100K	1/6W
R158	1-249-441-11	CARBON	100K	1/6W
R159	1-249-411-11	CARBON	330	1/6W
R160 ⚠	1-213-052-51	FUSIBLE	4.7	1W
R161	1-247-881-00	CARBON	120K	1/6W
R162	1-249-421-11	CARBON	2.2K	1/6W
R163	1-247-887-00	CARBON	220K	1/6W
R164	1-249-419-11	CARBON	1.5K	1/6W
R165	1-247-881-00	CARBON	120K	1/6W
R166	1-249-421-11	CARBON	2.2K	1/6W
R167	1-247-887-00	CARBON	220K	1/6W
R168	1-249-419-11	CARBON	1.5K	1/6W
R169	1-247-881-00	CARBON	120K	1/6W
R170	1-249-421-11	CARBON	2.2K	1/6W
R171	1-215-491-00	CARBON	820K	1/6W
R172	1-247-891-00	CARBON	330K	1/6W
R173	1-249-419-11	CARBON	1.5K	1/6W
R174	1-247-881-00	CARBON	120K	1/6W
R175	1-249-421-11	CARBON	2.2K	1/6W
R176	1-247-887-00	CARBON	220K	1/6W
R178	1-249-419-11	CARBON	1.5K	1/6W
R179	1-247-881-11	CARBON	120K	1/6W
R180	1-249-421-11	CARBON	2.2K	1/6W
R181	1-247-887-00	CARBON	220K	1/6W
R182	1-249-419-11	CARBON	1.5K	1/6W
R183	1-247-887-00	CARBON	120K	1/6W
R184	1-249-421-11	CARBON	2.2K	1/6W
R185	1-215-491-00	CARBON	820K	1/6W
R186	1-247-891-00	CARBON	330K	1/6W
R187	1-249-419-11	CARBON	1.5K	1/6W
R188	1-249-434-11	CARBON	27K	1/6W
R189	1-249-413-11	CARBON	470	1/6W
R190	1-249-438-11	CARBON	56K	1/6W
R191	1-249-419-11	CARBON	1.5K	1/6W
R192	1-249-434-11	CARBON	27K	1/6W
R193	1-249-413-11	CARBON	470	1/6W
R194	1-247-887-00	CARBON	220	1/6W
R195	1-249-439-00	CARBON	68K	1/6W
R196	1-249-419-11	CARBON	1.5K	1/6W
R197	1-249-434-11	CARBON	27K	1/6W
R198	1-249-414-11	CARBON	560	1/6W
R199	1-215-464-00	CARBON	62K	1/6W
R200	1-249-420-11	CARBON	1.8K	1/6W
R201	1-249-434-11	CARBON	27K	1/6W
R202	1-249-413-11	CARBON	470	1/6W
R203	1-249-438-11	CARBON	56K	1/6W
R204	1-249-420-11	CARBON	1.8K	1/6W
R205	1-249-434-11	CARBON	27K	1/6W
R206	1-249-413-11	CARBON	470	1/6W
R207	1-247-887-00	CARBON	220K	1/6W

RefNo.	Part No.	Description		
R208	1-249-439-11	CARBON	68K	1/6W
R209	1-249-419-11	CARBON	1.5K	1/6W
R210	1-249-434-11	CARBON	27K	1/6W
R211	1-249-413-11	CARBON	470	1/6W
R212	1-247-887-11	CARBON	220K	1/6W
R213	1-249-439-11	CARBON	68K	1/6W
R214	1-249-419-11	CARBON	1.5K	1/6W
R215	1-249-434-11	CARBON	27K	1/6W
R216	1-249-413-11	CARBON	470	1/6W
R217	1-249-438-11	CARBON	56K	1/6W
R218	1-249-419-11	CARBON	1.5K	1/6W
R219	1-249-434-11	CARBON	27K	1/6W
R220	1-249-413-11	CARBON	470K	1/6W
R221	1-247-887-00	CARBON	220K	1/6W
R222	1-249-439-11	CARBON	68K	1/6W
R223	1-249-419-11	CARBON	1.5K	1/6W
R224	1-249-434-11	CARBON	27K	1/6W
R225	1-249-413-11	CARBON	470	1/6W
R226	1-249-438-11	CARBON	56K	1/6W
R227	1-249-420-11	CARBON	1.8K	1/6W
R228	1-249-434-11	CARBON	27K	1/6W
R229	1-249-413-11	CARBON	470K	1/6W
R230	1-247-887-00	CARBON	220K	1/6W
R231	1-249-439-11	CARBON	68K	1/6W
R232	1-249-419-11	CARBON	1.5K	1/6W
R233	1-249-434-11	CARBON	27K	1/6W
R234	1-249-414-11	CARBON	560K	1/6W
R235	1-247-887-00	CARBON	220K	1/6W
R236	1-249-439-11	CARBON	68K	1/6W
R237	1-249-419-11	CARBON	1.5K	1/6W
R238	1-249-434-11	CARBON	27K	1/6W
R239	1-249-413-11	CARBON	470K	1/6W
R240	1-247-887-00	CARBON	220K	1/6W
R241	1-249-439-11	CARBON	68K	1/6W
R242	1-249-419-11	CARBON	1.5K	1/6W
R243	1-249-434-11	CARBON	27K	1/6W
R244	1-249-413-11	CARBON	470K	1/6W
R245	1-249-438-11	CARBON	56K	1/6W
R246	1-249-419-11	CARBON	1.5K	1/6W
R247	1-249-434-11	CARBON	27K	1/6W
R248	1-249-413-11	CARBON	470	1/6W
R249	1-249-438-11	CARBON	56K	1/6W
R250	1-249-420-11	CARBON	1.8K	1/6W
R251	1-249-430-11	CARBON	12K	1/6W
R252	1-249-409-11	CARBON	220	1/6W
R253	1-249-433-11	CARBON	22K	1/6W
R254	1-249-419-11	CARBON	1.5K	1/6W
R255	1-249-430-11	CARBON	12K	1/6W
R256	1-249-409-11	CARBON	220	1/6W
R257	1-249-433-11	CARBON	22K	1/6W
R258	1-249-419-11	CARBON	1.5K	1/6W
R259	1-249-430-11	CARBON	12K	1/6W
R260	1-249-409-11	CARBON	220	1/6W
R261	1-247-887-00	FUSIBLE	220K	1W
R262	1-249-434-11	CARBON	27K	1/6W

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RefNo.	Part No.	Description		
R263	1-249-419-11	CARBON	1.5K	1/6W
R264	1-249-430-11	CARBON	12K	1/6W
R265	1-249-409-11	CARBON	220	1/6W
R266	1-249-433-11	CARBON	22K	1/6W
R267	1-249-419-11	CARBON	1.5K	1/6W
R268	1-249-430-11	CARBON	12K	1/6W
R269	1-249-409-11	CARBON	220	1/6W
R270	1-249-433-11	CARBON	22K	1/6W
R271	1-249-419-11	CARBON	1.5K	1/6W
R272	1-249-430-11	CARBON	12K	1/6W
R273	1-249-409-11	CARBON	220	1/6W
R274	1-247-887-00	CARBON	220K	1/6W
R275	1-249-434-11	CARBON	27K	1/6W
R276	1-249-419-11	CARBON	1.5K	1/6W
R281	1-249-430-11	CARBON	12K	1/6W
R282	1-249-409-11	CARBON	220	1/6W
R283	1-249-433-11	CARBON	22K	1/6W
R284	1-249-419-11	CARBON	1.5K	1/6W
R285	1-249-430-11	CARBON	12K	1/6W
R286	1-249-409-11	CARBON	220	1/6W
R287	1-247-887-11	CARBON	220K	1/6W
R288	1-249-434-11	CARBON	27K	1/6W
R289	1-249-419-11	CARBON	1.5K	1/6W
R290	1-249-430-11	CARBON	12K	1/6W
R291	1-249-409-11	CARBON	220	1/6W
R292	1-247-887-00	CARBON	220K	1/6W
R293	1-249-435-11	CARBON	33K	1/6W
R294	1-249-419-11	CARBON	1.5K	1/6W
R295	1-249-430-11	CARBON	12K	1/6W
R296	1-249-409-11	CARBON	220	1/6W
R297	1-247-887-00	CARBON	220K	1/6W
R298	1-249-434-11	CARBON	27K	1/6W
R299	1-249-418-11	CARBON	1.2K	1/6W
R300	1-249-430-11	CARBON	12K	1/6W
R301	1-249-409-11	CARBON	220K	1/6W
R302	1-249-433-11	CARBON	22K	1/6W
R303	1-249-418-11	CARBON	1.2K	1/6W
R310	1-249-435-11	CARBON	33K	1/6W
R320⚠	1-213-052-51	FUSIBLE	4.7	1W
R501	1-249-437-11	CARBON	47K	1/6W
R502	1-249-437-11	CARBON	47K	1/6W
RY101	1-515-519-00	RELAY		
SW101	1-570-707-21	SWITCH, SLIDE (INPUT LEVEL)		
SW102	1-570-707-21	SWITCH, SLIDE (OUTPUT LEVEL)		
SW103	1-571-219-11	SWITCH, PUSH (EQ)		
SW104	1-571-219-11	SWITCH, PUSH (FILTER)		
SW105⚠	1-554-011-00	SWITCH, SHAFT (AC POWER)		
VR101	1-226-285-00	RES, VAR	50KA (LEVEL)	
VR102	1-237-798-11	RES, VAR	20KCX3 (HPF)	
VR103	1-237-797-11	RES, VAR	10KCX3 (LDF)	
VR104	1-224-255-XX	RES, ADJ	50KA (DC BALANCE)	
VR201-VR231	1-237-838-11	RES, VAR	50K/ (GEQ)	

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-701-948-08	BAG, POLYETHYLENE
2-054-709-00	BAG, POLYETHYLENE
3-701-631-00	BAG, POLYETHYLENE
2-335-464-11	MANUAL, INSTRUCTION
⚠1-551-631-14	CORD, POWER

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SONY Sound Tec Corporation

9-977-016-11

English
87K0412-1
Printed in Japan
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